

REMARKS

At the time of the Final Office Action dated March 27, 2003, claims 2-8 were pending in this application. Applicant acknowledges, with appreciation, the Examiner's allowance of claims 2 and 5-8. Claim 3 has been amended to recite that control of the applied voltage by the voltage control section occurs contemporaneously with input of the signal output to the voltage control section by the warpage sensor, consistent with the first full paragraph on page eight of Applicant's disclosure of the invention.

Claim 3 is rejected under 35 U.S.C. § 103 for obviousness based upon Nagao in view of Hoinkis et al., U.S. Patent No. 5,872,694 (hereinafter Hoinkis)

In the second enumerated paragraph of the Office Action, the Examiner concluded that one having ordinary skill in the art would have been motivated to modify the electrostatic chucking system of Nagao in view of Hoinkis to arrive at the claimed invention. This rejection is respectfully traversed.

Initially, Applicant notes that claim 3 has been amended to recite that control of the applied voltage by the voltage control section occurs contemporaneously with input of the signal output to the voltage control section by the warpage sensor. Thus, the warpage of a particular wafer being sensed is used to determine the voltage being applied to an electrode that holds the particular wafer in the electrostatic chuck.

In the statement of the rejection, the Examiner admitted that Nagao fails to teach or suggest the use of a warpage sensor and relied upon Hoinkis for teaching an electrostatic chucking system that uses a warpage sensor. With regard to claim 3, although Nagao discloses many of the claimed features, including the claimed controlling applied voltage stepwise, the control is based upon reading from a temperature sensor. Hoinkis also discloses many of the claimed features, including a warpage measurement tool. However, the applied voltage of Hoinkis is not controlled stepwise, and the warpage is measured prior to processing and is not remeasured during processing.

Applicant respectfully submits that that Examiner cannot properly establish that it would have been obvious to combine the warpage sensor of Hoinkis with the stepwise control of Nagao. In this regard, the Examiner is referred to the paragraph entitled "THE PROPOSED MODIFICATION CANNOT CHANGE THE PRINCIPLE OF OPERATION OF A REFERENCE" in M.P.E.P. § 2143.03.¹ The teachings of Nagao are specifically directed to determining the temperature of a wafer in an electrostatic chuck. In fact, not including the claims, the term "temperature" appears ninety-four separate times in Nagao. As described in column 5, lines 41-48 of Nagao, the temperature of an electrostatic chuck 14 is monitored by a thermocouple 11, and real-time data is used by the controller to determine the applied voltage. In advocating a modification of Nagao by using the warpage measurement tool 20 of Hoinkis to

¹ If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

determine voltage to be applied to the electrostatic chuck, the Examiner is changing the principle of operation of Nagao, which relies on the temperature of the wafer (and not warpage as advocated by Hoinkis) to determine the voltage to be applied to the electrostatic chuck.

Moreover, even if one having ordinary skill in the art were motivated to modify Nagao in view of Hoinkis, the claimed invention would not result. If Nagao were to be modified in view of Hoinkis, one having ordinary skill in the art would rely on the entire teachings of Hoinkis. Thus, upon choosing to add the warpage measurement tool 20 of Hoinkis to the electrostatic chuck Nagao, one having ordinary skill in the art would use the warpage measurement tool 20 in the same manner as the tool 20 is described being used in Hoinkis. As discussed in column 3, line 49 to column 4, line 2 of Hoinkis, the warpage measurement tool 20 measures the warpage prior to processing of a wafer 14 on the electrostatic chuck. This data is used by an electrostatic chuck software control 18 to determine a value of a minimum clamping voltage in a memory 19. This minimum clamping voltage is then applied by the electrostatic chuck voltage supply 16 during subsequent processing of the wafer 14. Thus, the warpage is measured only prior to processing. In contrast, claim 3 as amended, recites that control of the applied voltage by the voltage control section occurs contemporaneously with input of the signal output to the voltage control section by the warpage sensor.

Moreover, Hoinkis does not advocate using the warpage measuring tool 20 to supply a signal for controlling step-wise the applied voltage sent to an electrostatic chuck. Hoinkis merely teaches that a single piece of data (i.e., a minimum clamping voltage) is derived from the warpage measuring tool 20. A single piece of data, however, has not been established by the

Examiner as being sufficient to control step-wise the applied voltage sent to an electrostatic chuck. As such, even if one having ordinary skill in the art were motivated to modify Nagao in view of Hoinkis, the claimed invention would not result because Hoinkis teaches away from the claimed invention by measuring warpage prior to processing.

In the sixth enumerated paragraph on page four of the Office Action, the Examiner stated the following:

Hoinkins [sic] teaches the benefits of using a warpage sensor for controlling the applied voltage. The combination of Hoinkins [sic] with Nagao relies solely in this feature of Hoinkins [sic] for which the benefit has been established.

As stated by the Federal Circuit, a "determination of obviousness cannot be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention."² In this regard, the Examiner is also referred to M.P.E.P. § 2141, which states the references must be considered as a whole.³ By asserting that the rejection "relies solely in this feature of Hoinkins [sic]," the Examiner has clearly not considered the teachings of the applied prior art as a whole. Instead, the Examiner has impermissibly engaged in hindsight reconstruction of the claimed invention, in which the Examiner has selectively combined features from Nagao and Hoinkis while ignoring the teachings in these references that teach away from the claimed invention. Therefore, for the reasons stated above, Applicant respectfully

² ATD Corp. v. Lydall, Inc., 159 F.3d 534, 546, 48 USPQ2d 1321, 1329 (Fed. Cir. 1998).

³ When applying 35 U.S.C. § 103, the following tenets of patent law must be adhered to:

- (A) The claimed invention must be considered as a whole;
- (B) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;
- (C) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and
- (D) Reasonable expectation of success is the standard with which obviousness is determined.

Hodosh v. Block Drug Co., Inc., 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).

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solicits the withdrawal of the imposed rejection of claim 3 under 35 U.S.C. § 103 for obviousness based upon Nagao in view of Hoinkis.

Claim 4 is rejected under 35 U.S.C. § 103 for obviousness based upon Nagao in view of Hunter, U.S. Patent No. 6,244,121

In the third enumerated paragraph of the Office Action, the Examiner concluded that one having ordinary skill in the art would have been motivated to modify the electrostatic chucking system of Nagao in view of Hunter to arrive at the claimed invention. This rejection is respectfully traversed.

In the statement of the rejection, the Examiner asserted that column 9, lines 60-62 of Hunter teaches the use of distance probe, and this citation is reproduced below:

Another active probe is a distance probe which can ensure that the wafer surface is both parallel to and at the proper distance from the target or shower head of the process chamber.

Applicant argued in the Amendment filed December 20, 2002, the following:

A review of this citation, however, yields no teaching that the probe sends data to a voltage control section for controlling an applied voltage. Furthermore, since Hunter fails to disclose a distance probe that sends data to a voltage control section, the probe of Hunter, therefore, cannot send data that controls step-wise an applied voltage sent to the electrostatic chuck.

The Examiner responded to this argument in the paragraph spanning pages four and five of the present Office Action with the following:

Regarding applicant's arguments that Hunter fails to disclose the claimed distance sensor, applicant is reminded of the distance probe disclosed in col.9 lines 60-67. After the sensors determine the distance from and angle of inclination between the probe and the target, it is inherent that this information needs to be sent in the form of a voltage as a control signal so that the wafer is both parallel and at the proper distance. (emphasis added)

Applicant submits that the Examiner's reliance upon the doctrine of inherency to disclose a distance probe that sends data to a voltage control section is misplaced. Inherency may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient to establish inherency.⁴ To establish inherency, the extrinsic evidence must make clear that the missing element must necessarily be present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.⁵ Furthermore, as articulated by the Honorable Board of Patent Appeals and Interferences in ex parte Schricker, 56 USPQ2d 1723, 1725 (BPAI 2000):

However, when an examiner relies on inherency, it is incumbent on the examiner to point to the "page and line" of the prior art which justifies an inherency theory. Compare, In re Rijckaert, 9 F.3d 1531, 1533, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (when the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in the prior art); In re Yates, 663 F.2d 1054, 107, 211 USPQ 1149, 1151 (CCPA 1981).

The Examiner did not discharge that burden of indicating where the teaching that a signal be input into a voltage control section appears in the prior art. Thus, the Examiner has not established that this limitation is inherently disclosed by Hunter. In this regard, the Examiner is also referred to M.P.E.P. § 2112, entitled "Requirements of Rejection Based on Inherency; Burden of Proof."

Moreover, Hunter does not advocate using the distance probe to supply a signal for controlling step-wise the applied voltage sent to an electrostatic chuck. *Assuming arguendo* that a clamping voltage is derived from the distance probe, the Examiner has not established that

⁴ In re Rijckaert, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); In re Oelrich, 666 F.2d 578, 212 USPQ 323, (CCPA 1981).

⁵ Finnegan Corp. v. ITC, 180 F.3d 1354, 51 USPQ2d 1001 (Fed. Cir. 1999); In re Robertson, 169 F.3d 743, 49 USPQ2d 1949 (Fed. Cir. 1999); Continental Can Co. USA v. Monsanto Co., 20 USPQ 2d 1746 (Fed. Cir. 1991); Ex parte Levy, 17 USPQ2d 1461 (BPAI 1990).

distance probe sends data to a voltage control section capable of controlling step-wise the applied voltage sent to an electrostatic chuck.

With regard to the required motivation to combine, Applicant argued in the Amendment filed December 20, 2002, the following:

Not only has the Examiner failed to establish that Hunter discloses the claimed distance sensor recited in claim 4, the Examiner's proposed motivation of "the distance sensor is more cost efficient" is legally insufficient. The Examiner has merely copied, almost verbatim, certain benefits of Hunter without ever relating these benefits to the teachings of Nagao. For example, how are the "cost benefits" of the distance probe described in Hunter calculated and to what in Nagao is the distance probe being compared? If the distance probe of Hunter is not being compared to the temperature sensor of Nagao, why would the Examiner's proposed motivational element of "more cost efficient" motivate one having ordinary skill in the art to replace the temperature sensor of Nagao with the distance probe of Hunter?

The Examiner responded to this argument with the following on page five of the Office Action:

Regarding applicant's argument that the proposed motivation is insufficient, the examiner has further expanded motivation to better describe the benefits of having a distance sensor and why would a person skilled in the art would want to include such feature.

The additional asserted "benefits" referred to by the Examiner in the citation above are "avoiding damage to the wafer for [sic] improper alignment" and "that if the cost needs to be reduced the weight of the distance probe may be increased." The Examiner referred to column 10, lines 4-5 for support of the second asserted benefit. However, upon reviewing this passage, Applicant respectfully submits that such a "benefit" would not have motivated one having ordinary skill in the art to modify Nagao in view of Hunter. This passage in Hunter merely states that because "the mass of the probe is not a significant issue," then "the weight of the distance probe may be increased if necessary to reduce the cost." Thus, the Examiner's asserted benefit of "reduced cost" is not a result of using a distance probe in place of another probe. Instead, the reduced costs results from being able to use a larger probe, under the assumption that as a

particular probe becomes miniaturized, the cost of the probe increases. As this is not an issue, one having ordinary skill in the art would not have been motivated to modify Nagao in view of Hunter on this basis.

As to the Examiner first asserted benefit of "avoiding damage" because of "improper alignment," Applicant cannot find where Hunter teaches that this type of probe would provide an improvement over the temperature probe of Nagao. Absent any comparison of benefits and/or disadvantages between the two probes, why would one having ordinary skill in the art consider it obvious to replace the temperature probe of Nagao with the distance probe of Hunter? Therefore, for the reasons stated above, Applicant respectfully solicits the withdrawal of the imposed rejection of claim 5 under 35 U.S.C. § 103 for obviousness based upon Nagao in view of Hunter.

Applicant has made every effort to present claims which distinguish over the prior art, and it is believed that all claims are in condition for allowance. However, Applicant invites the Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance. Accordingly, and in view of the foregoing remarks, Applicant hereby respectfully requests reconsideration and prompt allowance of the pending claims.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper,

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including extension of time fees, to Deposit Account 500417, and please credit any excess fees to such deposit account.

Respectfully submitted,

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